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On-farm energy – Can we make it work?

Meeting the Challenge:
Farming In Uncertain Times
Nebraska Lincoln EXTENSION

By Bill Booker
UNL Extension Educator

The volatility of the biofuels industry has created another reason for farmers to consider producing "on- farm energy."

Producing biofuel on the farm has the potential to help farmers become more independent by developing a more stable and secure fuel supply, as well as benefit the environment and prolong equipment life. But first they must study and understand the process, the risks, and opportunities.

As little as a year ago, biodiesel production was expected to rise rapidly, as it had for several years. But the sudden fall in crude oil prices changed the direction of the production curves.

Loren Isom, Technical Assistance Coordinator at UNL's Industrial Agricultural Products Center, said 2008 biodiesel production prediction is estimated at 450 million gallons, about the same as 2007. This change in momentum has idled about 70 percent of the production capacity (Current ethanol production is about 20 percent idle).

Most biodiesel produced in the United States is now exported to Europe. How can our biofuels work overseas and not here? Two factors impact domestic production. The first is the $1-per-gallon federal blender tax credit, paid to those who blend B100 (pure biodiesel) with petroleum diesel fuel to produce, for example, a B5 blend (5 percent biodiesel, 95 percent petroleum). The blender credit allows U.S.-produced biodiesel to be competitive in Europe and somewhat competitive in this country. The blender credit expires on Dec. 31, and non-renewal would further challenge the biodiesel industry. Current soybean oil prices are $2.66 per gallon; assuming a 50-cent production cost would result in $3.16-per-gallon biodiesel. The blender credit, then, provides an incentive to produce.

The second factor impacting production is government mandates for biodiesel use, or the lack of them. Europe's demand is based on mandated biodiesel use. In the United States there are some state or local mandates, such as Minnesota's B2. These were likely intended to help reduce petroleum demand, but a B1or B2 blend also could have other benefits, such as meeting stricter emission standards or improving the lubricity of a vehicle's fuel-delivery system, extending its life and maintenance intervals.

So how might biodiesel production be incorporated into a farming operation?

One energy-conserving concept is setting aside part of the production acres for oilseed crops to meet biodiesel production goals. For example, a farmer-entrepreneur could farm a quarter-section pivot with fuel produced from oil crops raised in the corners. Crops such as sunflower, safflower, canola and camelina can produce more than twice as much oil per acre as soybeans. The meal residual can then be fed to livestock.

But this on-farm energy security requires a financial and personal commitment. Neighboring producers may join in to help justify the investment and spread the security. Crushers or expellers, followed by a processing or transesterification plant, can cost as little as $10,000 (for a complete unit) or as much as you want to spend.

There are many possibilities and opportunities here. The more costly system implies higher production and efficiency, and it is definitely a function of the entrepreneurial climate. Additional markets are available for the oil, such as human consumption. Ridding food products of trans fats has increased demand for these healthy oils.

Transesterification is the refining process that transforms raw vegetable oils to true biodiesel (B100), basically by removing glycerin and impurities. Then the biodiesel has to meet federally established ASTM (American Society for Testing Materials) standards to assure quality and uniformity. This also assures meeting engine manufacturers' performance standards. UNL recommends that all biodiesel meet these industry quality standards.

Those who choose to skip the transesterification process and burn the raw vegetable oil in their engines need to recognize and expect the associated risks and liabilities. This could plug injectors in the vehicles in which it is used, or void the manufacturer's warranty. This would affect both the farmer producing the biodiesel and anyone who uses the fuel. It is best to process the vegetable oil into biodiesel according to ASTM standards.

For the biofuels sector to stabilize, according to Ken Cassman, Director for Nebraska Center for Energy Sciences at UNL, there must be a stabilization or control of oil prices first. This could apply to our entire economy.

On-farm independence using energy opportunities are there, but must be studied and understood to be taken advantage of.

Producers who are interested in learning more about on-farm energy are encouraged to call Bill Booker at 308-762-5616.